

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN**

WISCONSIN ALUMNI RESEARCH
FOUNDATION,

Plaintiff,

v.

APPLE INC.,

Defendant.

Case No. 3:14-cv-00062-BCC

**APPLE INC.'S FIRST AMENDED ANSWER TO COMPLAINT AND
COUNTERCLAIMS**

Defendant Apple Inc. (“Apple”) responds to the Complaint filed by Plaintiff Wisconsin Alumni Research Foundation (“WARF” or “Plaintiff”) as set forth below. To the extent not specifically admitted, Apple denies the allegations of the Complaint.

RESPONSES TO SPECIFIC ALLEGATIONS OF COMPLAINT

I. INTRODUCTION¹

1. Apple admits that this is an action for patent infringement. Apple lacks knowledge or information sufficient to admit or deny the remaining allegations contained in Paragraph 1, and therefore denies the same.

2. Apple admits that the patent-in-suit is United States Patent No. 5,781,752 (“’752 patent”), that it is entitled “Table Based Data Speculation Circuit for Parallel Processing Computer,” and that it lists Andreas Moshovos, Scott Breach, Terani Vijaykumar, and Gurindar Sohi as named inventors. Apple denies that the ’752 patent “significantly improved the

¹ For convenience and clarity, Apple’s Answer uses the same headings as in WARF’s Complaint. Apple does not admit any of the allegations contained in WARF’s headings.

efficiency and performance of contemporary computer processors,” or that it is “recognized as a major milestone in the field of computer microprocessor architecture/design.” Apple lacks knowledge or information sufficient to admit or deny the remaining allegations contained in Paragraph 2, and therefore denies the same.

3. Apple admits the allegations contained in Paragraph 3.

4. Apple admits that its iPhone 5s, iPad Air, and iPad mini with Retina Display products each contain Apple’s A7 processor. Apple denies the remaining allegations in paragraph 4.

5. Apple denies the allegations contained in Paragraph 5.

II. PARTIES

6. Apple lacks knowledge or information sufficient to admit or deny the allegations contained in Paragraph 6, and therefore denies the same.

7. Apple admits the allegations contained in Paragraph 7.

III. JURISDICTION AND VENUE

8. No answer is required to the allegations in Paragraph 8, which consist of conclusions of law.

9. No answer is required to the allegations in Paragraph 9, which consist of conclusions of law. To the extent an answer is required, Apple admits that it maintains a retail store with employees in Wisconsin, that it has sold products in Wisconsin, and that the Court has personal jurisdiction over Apple. Apple denies the remaining allegations in Paragraph 9.

10. No answer is required to the allegations in Paragraph 10, which consist of conclusions of law. To the extent an answer is required, Apple admits, for purposes of this action only, that venue is proper in this District, but denies that it has committed any acts of

infringement in this or any other District. Apple lacks knowledge or information sufficient to admit or deny the remaining allegations contained in Paragraph 10, and therefore denies the same.

IV. FACTUAL ALLEGATIONS

11. Apple admits that an uncertified copy of what purports to be the '752 patent is attached to the Complaint as Exhibit A, that it is entitled "Table Based Data Speculation Circuit for Parallel Processing Computer," and that it lists Andreas Moshovos, Scott Breach, Terani Vijaykumar, and Gurindar Sohi as named inventors. Apple denies that the '752 patent was duly and legally issued.

12. Apple lacks knowledge or information sufficient to admit or deny the allegations contained in Paragraph 12, and therefore denies the same.

13. Apple admits that the '752 patent includes the statement quoted in paragraph 13.

14. Apple lacks knowledge or information sufficient to admit or deny the allegations contained in Paragraph 14, and therefore denies the same.

15. Apple denies the allegations contained in paragraph 15.

16. Apple admits that it has filed one or more patent applications that cite the '752 patent as prior art. Apple lacks knowledge or information sufficient to admit or deny the remaining allegations contained in Paragraph 16, and therefore denies the same.

17. Apple denies the allegations contained in Paragraph 17.

V. COUNT ONE: INFRINGEMENT OF U.S. PATENT NO. 5,781,752

18. Apple incorporates its responses to Paragraphs 1 through 17 as if set forth herein in full.

19. Apple denies the allegations contained in Paragraph 19.

20. Apple admits that it designs, manufactures, and exclusively sells the A7 processor in certain Apple products. Apple denies the remaining allegations contained in Paragraph 20.

21. Apple denies the allegations contained in Paragraph 21.

22. Apple denies the allegations contained in Paragraph 22.

23. Apple denies the allegations contained in Paragraph 23.

24. Apple denies the allegations contained in Paragraph 24.

25. Apple denies the allegations contained in Paragraph 25.

26. Apple denies the allegations contained in Paragraph 26.

27. Apple denies the allegations contained in Paragraph 27.

VI. PRAYER FOR RELIEF

WARF's prayer for relief contains no allegation to which a response is required, but to the extent any answer is required, Apple denies that WARF is entitled to the requested relief or to any relief whatsoever.

VII. DEMAND FOR JURY TRIAL

28. Apple admits that WARF has requested a jury trial. Apple denies that WARF has raised any valid claims in its Complaint.

AFFIRMATIVE DEFENSES

By alleging the Affirmative Defenses set forth below, Apple does not agree or concede that it bears the burden of proof or the burden of persuasion on any of these issues, whether in whole or in part. For its Affirmative Defenses to the Complaint, Apple alleges as follows:

FIRST AFFIRMATIVE DEFENSE (Non-Infringement)

1. Apple has not infringed and is not infringing, either directly, contributorily, or by inducement, any valid or enforceable claim of U.S. Patent No. 5,781,752 (the "752 patent"),

either literally or under the doctrine of equivalents, willfully or otherwise.

**SECOND AFFIRMATIVE DEFENSE
(Invalidity)**

2. Each claim of the '752 patent is invalid and/or unenforceable for failing to meet one or more of the requisite conditions for patentability under Title 35 of the United States Code, including without limitation §§ 101, 102, 103, 112, and/or 116.

3. For example, one or more claims of the '752 patent are rendered invalid under 35 U.S.C. §§ 102 (a), (b), (e), and/or 103 by at least United States Patent No. 5,615,350 to Hesson et al. (the "Hesson reference") and/or United States Patent No. 5,619,662 to Steely, Jr. et al. (the "Steely reference"), or combinations thereof. As stated below, each of these references is prior art to the '752 patent.

4. The Hesson reference issued on March 25, 1997, and has a priority date of October 24, 1994.

5. The Steely reference issued on April 8, 1997, and has a priority date of November 12, 1992.

6. The '752 patent is alleged on its face to have an earliest priority date of December 26, 1996.

7. The Hesson reference and the Steely reference each are therefore prior art references to the '752 patent.

**THIRD AFFIRMATIVE DEFENSE
(Prosecution History Estoppel)**

8. By reason of proceedings in the United States Patent and Trademark Office during prosecution of each and every one of the patents-in-suit, and specifically statements, arguments, amendments, assertions, and/or representations made by or on behalf of the applicants for the '752 patent, WARF is estopped to construe the claims of the '752 patent in any

way to cover any product, method, or service of Apple under the Doctrine of Equivalents.

**FOURTH AFFIRMATIVE DEFENSE
(No Exceptional Case)**

9. This is not an “exceptional” case within the meaning of 35 U.S.C. § 285.

**FIFTH AFFIRMATIVE DEFENSE
(No Injunctive Relief)**

10. WARF is not entitled to injunctive relief because any alleged injury to WARF is neither immediate nor irreparable, and Plaintiff has an adequate remedy at law.

**SIXTH AFFIRMATIVE DEFENSE
(Preclusion of Costs)**

11. To the extent that any claim of the ’752 patent is held to be invalid, WARF must be precluded from recovering costs related to this action pursuant to 35 U.S.C. § 288.

**SEVENTH AFFIRMATIVE DEFENSE
(Government Sales)**

12. To the extent that any accused product has been used or manufactured by or for the United States Government, WARF’s purported claims for damages are limited by 28 U.S.C. § 1498.

**SEVENTH AFFIRMATIVE DEFENSE
(Inequitable Conduct)**

13. The claims of the ’752 patent are unenforceable as a result of inequitable conduct on the part of the named inventors before the United States Patent and Trademark Office during its prosecution. Apple incorporates by reference all facts pled in paragraphs 21 thru 54 below in support of its Third Counterclaim.

RESERVATION OF ADDITIONAL DEFENSES

14. Apple reserves any and all additional defenses available under Section 35 of the United States Code, the rules, regulations, or laws related thereto, the Federal Rules of Civil

Procedure, the Rules of this Court, and/or otherwise in law or equity, now existing, or later arising, as may be discovered.

APPLE INC.'S FIRST AMENDED COUNTERCLAIMS

Counterclaim-Plaintiff Apple Inc. ("Apple"), on personal knowledge as to its own acts, and on information and belief as to all others based on its own and its attorneys' own investigation, alleges Counterclaims against Counterclaim-Defendant Wisconsin Alumni Research Foundation ("WARF") as follows:

NATURE OF THE ACTION

1. On information and belief, according to the allegations set forth in the Complaint, WARF is the owner and assignee of all rights, title, and interest in and to U.S. Patent No. U.S. Patent No. 5,781,752 (the "'752 patent").

2. WARF has accused Apple of infringing the '752 patent. Apple denies that any of its products infringe any valid or enforceable claim of the '752 patent.

3. An actual case and controversy exists between the parties concerning the infringement of one or more claims of the '752 patent, and that controversy is ripe for adjudication by this Court.

PARTIES

4. Counterclaim-Plaintiff Apple is a corporation organized under the laws of the State of California, and its principal place of business is in Cupertino, California.

5. On information and belief, according to the allegations in paragraph 6 of the Complaint, Counterclaim-Defendant WARF is a non-profit Wisconsin corporation having its principal place of business at 614 Walnut Street, Madison, Wisconsin 53726.

JURISDICTION AND VENUE

6. These are Counterclaims for a declaration of non-infringement and invalidity of

each claim of the '752 patent. This Court has subject matter jurisdiction over these Counterclaims pursuant to 28 U.S.C. §§ 1331, 1338, 2201, and 2202.

7. This Court has personal jurisdiction over WARF because WARF has already submitted to the jurisdiction of this Court by initiating the instant lawsuit.

8. Venue for these Counterclaims is legally proper in this District pursuant to 28 U.S.C. §§ 1367 and 1391 and because WARF chose to bring its action in this forum.

FIRST COUNTERCLAIM
(Declaration of Non-Infringement of the '752 Patent)

9. Apple repeats and realleges the allegations of the preceding Answer Paragraphs 1-28, Defenses Paragraphs 1-13, and Counterclaims Paragraphs 1-8 as if fully set forth herein.

10. Apple has not infringed and is not infringing, either directly, contributorily, or by inducement, any valid or enforceable claim of the '752 patent, either literally or under the doctrine of equivalents, willfully or otherwise.

11. To resolve the legal and factual questions raised by WARF and to afford relief from the uncertainty and controversy that WARF's accusations have precipitated, Apple is entitled to declaratory judgment that it has not infringed and is not infringing, directly or indirectly, any valid or enforceable claim of the '752 patent, either literally or under the doctrine of equivalents, willfully or otherwise.

SECOND COUNTERCLAIM
(Declaration of Invalidity of the '752 Patent)

12. Apple repeats and realleges the allegations of the preceding Answer Paragraphs 1-28, Defenses Paragraphs 1-13, and Counterclaims Paragraphs 1-11 as if fully set forth herein.

13. Each claim of the '752 patent is invalid for failing to meet one or more of the requisite statutory and decisional requirements and/or conditions for patentability under one or

more of 35 U.S.C. §§ 101, 102, 103, 112, and/or 116.

14. For example, one or more claims of the '752 patent are rendered invalid under 35 U.S.C. §§ 102 (a), (b), (e), and/or 103 by at least United States Patent No. 5,615,350 to Hesson et al. (the "Hesson reference") and/or United States Patent No. 5,619,662 to Steely, Jr. et al. (the "Steely reference"), or combinations thereof. As stated below, each of these references is prior art to the '752 patent.

15. The Hesson reference issued on March 25, 1997, and has a priority date of October 24, 1994.

16. The Steely reference issued on April 8, 1997, and has a priority date of November 12, 1992.

17. The '752 patent is alleged on its face to have an earliest priority date of December 26, 1996.

18. The Hesson reference and the Steely reference each are therefore prior art references to the '752 patent.

20. To resolve the legal and factual questions raised by WARF and to afford relief from the uncertainty and controversy from which WARF's accusations have precipitated, Apple is entitled to a declaratory judgment that the '752 patent is invalid.

THIRD COUNTERCLAIM (Inequitable Conduct)

21. Apple repeats and realleges the allegations of the preceding Answer Paragraphs 1-28, Defenses Paragraphs 1-13, and Counterclaim Paragraphs 1-19 as if fully set forth herein.

22. The '752 patent is unenforceable due to inequitable conduct by at least Andreas Moshovos and Gurindar Sohi, two of the four named inventors of the '752 patent.

23. Neither the named inventors of the '752 patent, nor any other individual who

assisted or participated in the preparation, filing, or prosecution of the application for the '752 patent (collectively, the "Applicants"), disclosed any prior art to the Patent Office during or otherwise in connection with the prosecution of the '752 patent. The Applicants filed no Information Disclosure Statement, or made any effort whatsoever to bring even a single item of prior art to the attention of the Patent Office.

24. While prosecuting the application that led to the '752 patent, Dr. Moshovos and Dr. Sohi [REDACTED], (1) U.S. Patent No. 5,619,662 to Simon Steely ("Steely Patent"), and (2) a 1981 article by James E. Smith, entitled "A Study of Branch Prediction Strategies" ("Smith Article").

25. [REDACTED]
[REDACTED],
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].

26. The author of the Smith Article, Dr. James Smith, was, like Dr. Sohi, a professor at the University of Wisconsin. [REDACTED]
[REDACTED]
[REDACTED].
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

27. Neither Dr. Moshovos nor Dr. Sohi—nor anyone else associated with the '752 patent application—disclosed the Steely Patent or the Smith Article to the Patent Office during prosecution of the '752 patent. Further, as described below, Dr. Moshovos and Dr. Sohi made statements in the '752 patent application and during the prosecution of the '752 patent that were false and misleading in light of the Steely Patent and the Smith Article.

28. By withholding the Steely Patent and Smith Article from the Patent Office, Dr. Moshovos and Dr. Sohi failed to disclose non-cumulative information OF which they were aware that was material to the patentability of the '752 patent. Had they disclosed the Steely Patent and/or the Smith Article during prosecution of the '752 patent, the Patent Office likely would not have allowed the claims of the '752 patent. Additionally, Dr. Moshovos and Dr. Sohi made affirmative misrepresentations of material fact, and submitted false material information, to the Patent Office during the prosecution of the '752 patent. In so doing, Dr. Sohi and Dr. Moshovos intended to mislead and deceive the Patent Office in order to gain issuance of the '752 patent.

A. Inequitable Conduct Based On The Steely Patent

29. The Steely Patent describes a processor architecture that allows load instructions to speculatively execute ahead of store instructions. This is the same subject matter as the '752 patent. Like the '752 patent application, the Steely Patent discloses a mechanism for predicting

when a particular instruction is likely to mis-speculate and, if a mis-speculation is predicted, prevents speculation for that instruction.

30. The Steely Patent is material to the patentability of the '752 patent because (1) by itself or in combination with other prior art, it invalidates claims of the '752 patent, including at least the independent claims, and (2) it is inconsistent with positions taken by the Applicants during the prosecution of the '752 patent.

31. Dr. Moshovos and Dr. Sohi [REDACTED], and knew that the Steely Patent was material and non-cumulative to the '752 application.

32. Dr. Moshovos and Dr. Sohi were aware of their obligations to disclose material prior art to the Patent Office.

33. The Steely Patent was withheld from the Patent Office, and it was neither made of record nor considered by the Patent Office during prosecution of the '752 patent. Nor was the Steely Patent cumulative of any information that the Patent Office did consider.

34. Additionally, during prosecution of the '752 patent, Dr. Moshovos and Dr. Sohi made affirmative statements about the state of the art that were false in light of the Steely Patent, as discussed below.

35. **First**, on October 8, 1997, the pending claims of the '752 application were rejected by the Examiner as being anticipated by U.S. Patent No. 5,555,432 ("Hinton"). The Examiner described Hinton as disclosing a "predictor receiving a misspeculation indication from the data speculation circuit to produce a prediction ... based on the misspeculation indication." Applicants responded by arguing that the claims were allowable over Hinton because, among other things, Hinton used "a predictor to predict when the results of a previous data producing

instruction will be available,” whereas the predictor in the claimed invention “does not determine when data will be available but whether there is data dependence by examining previous instances of mis-speculation.”

36. During prosecution of the '752 patent, Dr. Sohi and Dr. Moshovos were aware that this statement did not distinguish their patent application from the prior art. Had Dr. Sohi or Dr. Moshovos disclosed the Steely Patent to the Patent Office prior to the issuance of the '752 patent, the Examiner would have known that the above-quoted distinction was insufficient to distinguish the claimed invention from the prior art, for the Examiner would have known about prior art—the Steely Patent—that predicts whether there is a data dependence based on historical instances of mis-speculation.

37. In responding to the October 8, 1997 Office Action, Applicants also contended that “because the intent of Hinton appears to be to schedule instructions so that there can be no problem with data dependence, it *teaches away* from [the '752 invention's] prediction technique, which is valuable only when one speculatively executes data dependent instructions out of order.” This argument would not have been available if Dr. Soho or Dr. Moshovos had disclosed the Steely Patent. The Steely Patent discloses a predictor that does exactly what Applicants claimed was a point of novelty over the Hinton prior art: Rather than avoiding the problem of data dependence, it seeks to improve the accuracy of speculatively executing data dependent instructions out of order. Again, had the Steely Patent been disclosed to the Patent Office, the Examiner would have known that this distinction also was insufficient to distinguish the claimed invention from the prior art.

38. **Second**, in describing the state of the art, the specification of the '752 application states: “Data speculation circuitry currently does not decide when to do data speculation. Either

all memory accesses are speculated or none at all.” That statement is false in light of the Steely Patent. The Steely Patent did not use an “all or nothing” approach when it came to data speculation. Instead, a load in the Steely Patent could speculatively execute depending on whether it had mis-speculated in the past and, in some instances, how many times it mis-speculated in the past.

39. Had Applicants disclosed the Steely Patent during prosecution of the ’752 patent, the Patent Office likely would not have allowed the claims of the ’752 patent.

40. Dr. Moshovos and Dr. Sohi had a motivation to conceal the Steely Patent from the Patent Office, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

41. The foregoing shows that Dr. Moshovos and Dr. Sohi acted with the intent to deceive.

42. These acts and omissions constitute inequitable conduct and render the ’752 patent unenforceable.

B. Inequitable Conduct Based on the Smith Article

43. The Smith Article discloses a variety of predictors that are used for dynamically predicting the outcome of control instructions. These branch predictors are analogous to load/store predictors, and a predictor used to predict branches could be used to predict data dependences as described in the ’752 patent. The Smith Article thus contains disclosures that are material to the patentability of the ’752 patent.

44. The Smith Article was also material to the patentability of the '752 patent because, in combination with other prior art, it invalidates one or more claims of the '752 patent.

45. Dr. Moshovos and Dr. Sohi [REDACTED], and knew that the Smith Article was material to the patentability of the '752 patent application, and that it was non-cumulative of prior art before the Examiner during the '752 application.

46. Dr. Moshovos and Dr. Sohi were aware of their obligations to disclose material information to the Patent Office.

47. The Smith Article was not disclosed to the Patent Office, and the Patent Office did not otherwise locate or consider it during prosecution of the '752 patent. Nor was the Smith Article cumulative of any information that the Patent Office did consider.

48. Additionally, during prosecution of the '752 patent, the Applicants made affirmative statements that were false in light of the Smith Article.

49. Specifically, the '752 application described control dependences (i.e., “a dependency of instructions after a conditional branch”) and control speculation (i.e., “executing an instruction that follows a branch prediction without knowing the outcome of the branch”), but never mentioned any of the branch prediction strategies disclosed in the Smith Article. To the contrary, they told the Patent Office that “[t]ypically all control transfer instructions are speculated.” But this statement was inconsistent with the Smith Article, which did not merely disclose speculation all the time but rather disclosed a number of prediction strategies that could be used to improve the accuracy of control speculation.

50. Had Applicants disclosed the Smith Article during prosecution of the '752 patent, the Patent Office likely would not have allowed the claims of the '752 patent.

51. Dr. Moshovos and Dr. Sohi had a motivation not to disclose the Smith Article to the Patent Office, [REDACTED]

[REDACTED]

[REDACTED]

52. The foregoing shows that Dr. Moshovos and Dr. Sohi acted with the intent to deceive.

53. These acts and omissions constitute inequitable conduct and render the '752 patent unenforceable.

54. Apple is entitled to a declaratory judgment that the '752 patent is unenforceable.

PRAYER FOR RELIEF

WHEREFORE, Apple requests entry of judgment in its favor and against WARF as follows:

- a. Dismiss WARF's Complaint in its entirety, with prejudice;
- b. Enter judgment in favor of Apple and against WARF;
- c. Enter a judgment and declaration that the '752 patent and each and every claim thereof are not infringed by Apple;
- d. Enter a judgment and declaration that the '752 patent and each and every claim thereof are invalid and/or unenforceable;
- e. Award to Apple its costs, expenses, and reasonable attorneys' fees, pursuant to 35 U.S.C. § 285; and
- f. Grant to Apple any such other relief that this Court deems proper.

JURY DEMAND

19. Pursuant to Fed. R. Civ. P. 38(b), Apple requests a trial by jury on all issues so triable.

Dated: June 13, 2014

Respectfully submitted,

/s/ Andrea Weiss. Jeffries
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